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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,637	10/30/2003	Sivapa Kia Ganapathiappan	10010060-6	3390

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HEWLETT-PACKARD COMPANY  
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EXAMINER  
ZALUKAEVA, TATYANA

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 09/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/698,637

Applicant(s)

GANAPATHIAPPAN, SIVAPA KIA

Examiner

Tatyana Zalukaeva

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 13 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by US 20040171779 A1

Disclosed is catalytic processes for the controlled polymerization of free radically (Co)polymerizable monomers and functional polymeric systems prepared thereby

Reverse ATRP is the preferred approach in emulsion polymerization if the target product is a stable small particle sized latex. In such systems there is a linear increase of molecular weight with monomer conversion. This indicates that the number of chains is constant, in other words, chain transfer reactions are negligible. The products display low polydispersities (1.2-1.5), meaning that nearly all the chains start to grow simultaneously with the same speed. Both features suggest that the polymerization can be regarded as controlled. The final latex is usually stable, lasting from days to even more than a year without any sedimentation. The final particle size is reproducible, in the range of 200 mn. In all the experiments, it is observed that the measured particle diameter progressively decreases until 20% to 40% conversion, then keeps constant after 40% conversion. Emulsion polymerization is performed in the presence of a crosslinker, [0029], [0033], [0121], [0169-hydrophilic and hydrophobic comonomers] [0173].

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3. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'779 in view of US 6627314 B2 to the same inventor as US'779 (Matyjaszewski; Krzysztof)

US'779 does not specifically disclose the use of polymerizable dye as a comonomer.

US'314 discloses preparation of nanocomposite structures by controlled (ATRP) polymerization to obtain polymers with polydispersity of 1.2.

It is advantageous to confirm and measure the number of attached initiator functional groups prior polymerization of the multifunctional initiator particles for construction of nanocomposite particles or structures. One approach to determining the number of initiation sites per particle, was demonstrated by use of bithiophene-chlorosilane in the synthesis of the functional particle. The bithiophene groups act as UV-absorbing chromophores. The immediate advantage was the ability to confirm the incorporation of bithiophene groups to the particle, and, therefore, incorporation of radically transferable atoms, by online UV detection in SEC measurements. Such a confirmation could not be done directly for 2-bromoisobutyryl-chlorosilanes treated particles due to the absence of UV-absorbing chromophores or other readily observable functional group. This incorporation of a light responsive functionality into the structure further demonstrates the relative ease with which external stimuli responsive, self assembling, structures can be constructed. One skilled in the art will readily understand that other functional groups may be incorporated onto the surface of the functionalized particle which will respond to additional external stimuli, such as, for example, solvents, heat, moisture, electric

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current, sound or other chemicals, such as dihydroxy compounds.

One of the advantages of using the bithiophene-chlorosilane was the ability to confirm the incorporation of bithiophene groups to the particle by online UV detection in SEC measurements. This could not as easily be done for 2-bromoisobutryl-chlorosilanes due to the absence of UV-absorbing chromophores on the functionalized particle.

Based on the identity of two processes described by Matyjaszewski, on the substantial similarity of the particles obtained by these processes and on suggestion of both references that different types of comonomers are useful in preparation of the particles, one skilled in the art would have found obvious to include the chromophore (polymerizable dye) monomer into the list of comonomers taught by Matyjaszewski'779 with the reasonable expectation of success.

With regard to claim 16 both references suggest different ratios and basically do not concentrate on specific ratios of comonomers. Since there is no showing of criticality of claimed ranges in the instant specification it is held by the Courts that differences in concentration, for example, will not support the patentability of a subject matter encompassed by the prior art unless there is an evidence indicating such concentration or temperature is critical. Furthermore, wherein the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine optimization, *In re Aller*, 220 F.2d 454,456, 105 USPQ 233, 235 (CCPA 1955), see also *In re Hoeschele* 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). In other words if there is no links between the optimization and a parameter the optimization is obvious.

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4. Claims 13-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kumacheva et al (U.S. 2001/0043495).

Kumacheva in Example 1 [0090, 0091] discloses copolymerization using monodisperse latex particles composed of rigid cores and softer shells, as illustrated in FIG. 1, part A. The core-shell particles 1 had poly(methyl methacrylate) (PMMA) cores 2 and poly(methyl methacrylate)-poly(butyl methacrylate) shells 3 synthesized using a multistage emulsion polymerization.

[0091] A fluorescent comonomer 4-amino-7-nitrobenzo-2-oxa-1,3-diazol-methacrylate (NBD-MA) was synthesized and copolymerized with PMMA in amount of ca. 0.02 mol %. The diffusion of the dye-labeled PMMA molecules from the cores to the shells was suppressed by cross-linking the core-forming polymer. The dimensions of the fluorescent cores ranged from 100 to 800 nm. Latex particles with 500 nm cores and 200 nm thick shells were used. Under these conditions, the minimum energy configuration corresponds to assembly of the latex particles in either HCP or FCC crystal structure. The samples, with the thickness ranging from 1 to 10 mm showed efficient Bragg's diffraction in the reflection mode. The polydispersity of the polymer is within the claimed range. IN the instant case the patentability or nonpatentability of the claimed product is determined by the characteristics of the product per se, not by the process by which it was made. The rationale of this approach is fully addressed in the previous office action.

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5. Applicant's arguments with respect to claims 13-16 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (571) 272-1115. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tatyana Zalukaeva  
Primary Examiner  
Art Unit 1713

September 14, 2004

A handwritten signature in black ink, appearing to read 'T. Zalukaeva', with a long, sweeping horizontal stroke extending to the right.